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ASSISTANT COMMISSIONER FOR PATENTS  
PATENT APPLICATION  
Washington, D.C. 20231

CASE DOCKET NO. YO999-298  
Date: June 30, 1999

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Transmitted herewith for filing is the Patent Application of:

Inventors: D. Kanevsky, et al.

For: SYSTEM AND METHOD FOR INFORMATION TRANSFER OVER A NETWORK

Enclosed are:

X 2 Sheets of Informal Drawings.

X An assignment of the invention to International Business Machines Corporation, Armonk, New York 10504.

       A certified copy of a        application.

X Declaration and Power of Attorney is attached to the application.

X Associate Power of Attorney.

X Information Disclosure Statement with form PTO-1449 with references attached.

The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)
FOR:	NO. FILED	NO. EXTRA
BASIC FEE		
TOTAL CLAIMS	21 - 20 =	1
INDEP CLAIMS	5 - 3 =	2
<u>      </u> MULTIPLE DEPENDENT CLAIM PRESENTED		

If the difference in Col. 1 is less than zero, enter "0" in Col. 2.

OTHER THAN A  
SMALL ENTITY

RATE	FEE
	\$ 760.00
X \$ 18 =	\$ 18.00
X \$ 78 =	\$ 156.00
+ \$ 260 =	\$ 0.00
TOTAL	\$ 934.00

X Please charge my Deposit Account No. 09-0468 in the amount of \$ 934.00.

X The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 09-0468. A duplicate copy of this sheet is enclosed.

X Any additional filing fees required under 37 CFR 1.16.

X Any patent application processing fees under 35 CFR 1.17.

Respectfully submitted,

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**SYSTEM AND METHOD FOR INFORMATION TRANSFER OVER A  
NETWORK**

**DESCRIPTION**

**BACKGROUND OF THE INVENTION**

5 *Field of the Invention*

The present invention is related to transferring remotely stored data across a network and, more particularly, to transferring objects across a network to a local computer from a remotely  
10 connected computer and displaying the transferred data.

*Background Description*

Computers running software referred to as web browsers for connecting to a remote computer system, retrieving the contents of a database on the remote  
15 system and visually displaying the retrieved data on a local client system, are well known in the art. Typically, images are requested by a web browser user on a client computer system. The remote system  
20 receiving the request, retrieves the images from the database and transmits the images across what is commonly referred to as the internet or world wide web (www). The apparent speed of the transfer is directly proportional to the amount of data that  
25 must be transferred. Accordingly, to improve apparent transfer speed, reduce the amount of time

that the user must wait for the transfer and to minimize web traffic congestion, data reduction or compression methods are constantly being sought.

Thus, there are various well known data  
5 reduction standards such as those referred to as  
JPEG, TIFF and GIF for images, MPEG for movies and  
RP3 for sound. However, even employing these well  
known standards, transferring data required to  
present a relatively simple image may cause a  
10 significant delay, thereby resulting in inactive or  
dead time at the client system. Accordingly, there  
is a need for data compression methods for improving  
internet image transfers.

#### **SUMMARY OF THE INVENTION**

15 It is a purpose of the invention to decrease  
net workload;

It is another purpose of the present invention  
to decrease apparent time required to pass  
information over a network;

20 It is yet another purpose of the present  
invention to decrease apparent time to load web  
pages while still maintaining page aesthetics;

It is yet another purpose of the present  
invention to off-load server storage of information.

25 The present invention is an interface device  
for connecting to and retrieving data from a remote  
computer system, and a method of compressing,  
decompressing and transferring data therefor. A

user may set transfer constraints on the interface device. The interface device may be a web browser. The user selecting a web site requests data, often image data from a remote computer system. The  
5 interface device includes a cache memory where generic objects may be stored. Each generic object corresponds to an original object in the requested data. Depending on the data transfer constraints, instead of retrieving the entire image, e.g., web  
10 page image, unaltered from the host system, a skeletal image is retrieved, initially, wherein generic objects are substituted for each corresponding original object. A pseudo-image is displayed, with the generic objects substituted for  
15 corresponding original objects. Subsequently received original objects may be substituted for generic objects as each original object is received.

Additionally, as selected, a web page is displayed using generic codes previously cached in  
20 prior downloads. Thus, the generic coded information is made ready, but is not played or displayed until a link to the web page is selected. Upon link selection, the information is presented so that user observes it while waiting for the new page  
25 to be downloaded to the browser. This enhances web browser operation by causing the performance of useful or pleasing audio or images for the user during the wait period, that typically occurs between link selection and viewing, i.e., during  
30 downloading. The downloaded image may be a hypertext document represented by text or images. The codes may include wave files or other sound

files such as rp3 files. Thus, generic codes for music, advertisements, copyright information, and the like may be included.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

5           The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, in which:

10           Fig. 1 is a flow diagram of the preferred embodiment system for sending, receiving and displaying Code over the internet.

15           Fig. 2 shows normal browsing of a web site according to the preferred embodiment of the present invention.

#### **DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION**

20           As used herein, Information refers to images, audio, animations, 2-D and 3-D graphics, and other data transferred over a network; Generic Information refers to common or standard Information that usually resides on both a client system and a remote system; Code refers to text, numbers, or other compact identifiers for Generic Information.

25           Further, Generic Information may be stored in a database on a compact disk (CD), digital versatile

disk (DVD), a hard-disk, a company server or, an internet service provider (ISP) hub.

Generic Information may include sketches, clip art images, cartoons, commonly used images (e.g. forests, animals...), melodic sequences, 3-D graphics for virtual reality environments, tactile information for virtual reality environments, wave files, etc. A Generic Information database is a library of numerous useful images and sound waveforms that might be supplied for example when a user purchases something on-line or downloads web pages on a web-browser.

Referring now to the drawings and, more particularly, Figure 1 is a flow diagram of the preferred embodiment system for sending, receiving and displaying Code over the internet. Accordingly, in step 100, a user connects to a remote web site and begins browsing remote Information using a client web browser. Constraints may be placed on the web connection session by the user, the ISP, the remotely connected host, or internet related variables.

Accordingly, in step 102 the user may direct the client system to estimate network congestion by pinging the remote host on which the Information resides. Alternatively, the client web browser may generate an estimate concerning remote information access, generated by analyzing the user's past access times to the same remote host or, by

considering other relevant parameters such as time of day or remote host's country of origin.

5 In parallel with the traffic estimation step 102, the browser or other related software is checked to determine whether the user has placed the client browser in quick mode in step 104. In quick mode, the browser is to present only Generic Information, making detailed information superfluous. Alternately, in step 106, the client  
10 may have been placed in quick mode by the ISP or, for example, by parental control software; or, the remote host server may limit transfers to sending Code, so as to reduce demand on the server.

15 It should be noted at the outset that, in step 100, the user may specify an importance level of Information to be requested. In this case, in step 108, the client system determines "importance" of the coded information. If the importance level is high, then, in step 110, the host server sends  
20 larger specific Information rather than Generic Information. Importance may determined by the user, the client, the ISP, the provider of the remote host Information, or determined by algorithm on the client system. For example, importance may be based  
25 on criteria such as the number of times the information has been accessed in the past, the subject matter type, specific instructions provided by web browser users or, latent semantic indexing.

If the importance of the requested Information is determined, as previously described, in step 108 to be high; or, based on the traffic estimation results in step 102, if network traffic is not congested in step 112; or, in step 114, it is determined that the user has not selected quick mode; or, in step 116, it is determined that the ISP or network conditions have not placed the browser in quick mode; then, in step 110, the browser presents the web page normally. If, however, network traffic is congested in step 112; or, the browser or server is in quick mode in steps 114 or 116, respectively; then, in step 118, a transfer is initiated for the Code for Generic Information rather than the larger more specific web site specific Information.

In step 120, the remote host server returns the more compact Code to client. The Generic Information specified by the Code may include object specific characteristics such as color as well as a particular object's location or a location relative to other Generic Information. Along with Code for the current web site image, in step 122, the client receives Generic Information Codes corresponding to related images, e.g., web pages linked to the current web page.

As the Code is received by the client, in step 124, the client system checks to determine whether the Code and any accompanying Information already exist in any local client database. Optionally, if the Code and Generic Information does not exist



locally, then, in step 126, the client requests that  
server send Generic Information and Code to the  
client for current and future use. At the user's  
option, this step 126 may be ignored. Finally, in  
5 step 128, the client web browser presents the  
Generic Information (associated with Code) to the  
user.

The flow diagram of Figure 2 shows normal  
browsing of a web site according to the preferred  
10 embodiment of the present invention. Once the  
current web page is loaded by the browser, in step  
130, the user browses the displayed Information.  
Next, in step 132, while the current web page is  
browsed, the remote host server sends next page  
15 Codes, which are cached at the browser. Information  
corresponding to the concurrently received Code is  
not displayed nor otherwise performed at the  
browser, but merely cached for subsequent use.  
Then, in step 134, the user selects another linked  
20 page for browsing. As the host server is  
transmitting data for the selected web page, Generic  
Information corresponding to the previously cached  
Code may be displayed or performed in Step 136.

Thus, the Coded Information is played or  
25 displayed while waiting for the next page. Thus,  
the web browser operation is enhanced by providing  
pleasing audio, images or other Information, which  
the user observes during the normally dead period  
between linking to the web site and downloading all  
30 of the hypertext document as represented by text or

images on the current web page. The Codes may be, for example, code for music, advertisements, copyright information, and the like. Other generic objects may include trees, roots, houses, a kitchen, a wall in a house, the side of a house, hotel, city, street, the sky or the sea.

### EXAMPLES

A user, attempting to browse a remote web page, enters the page's URL into a web browser. The client system determines that the network is very congested in step 102 and, rather than download actual images from the remote host, selectively downloads a Generic Code for a generic image, which is subsequently displayed. So, in this example, while specific hyper text markup language (HTML) `` may specify a full image of a particular dog, `<img srccode=2817>` may specify the Code for a generic dog image, cached in a prior download or residing in the user's local database of Generic Information. The browser uses these codes to lookup generic images in the user's database and substitutes these when the web page is displayed.

In another example, a first user wishes to send a digital photo of himself standing in front of a beautiful mountain range; an advertiser wishes to send a photo of a new car in front of a starry sky. These users may specify a background scene using simple English, such as "mountains" or "starry sky." These English words are the Codes for generic images. Using image processing software, these

specific foreground images may be merged with the specified generic code to create the final scene.

5 In yet another example, at 4:00pm, a user participating in a virtual-reality chat room has audio, visual and tactile feedback. The chat room topic is kaleidoscopes. The user's system detects that exact tactile and audio components are unimportant to the chat. Additionally, it is the peak network traffic period, which causes receipt of  
10 a byte Code specifying Generic Information to be sent to the user. Responsive to the byte code, generic muzak is played while the user is presented with a generic oscillating sensation.

15 Accordingly, the present invention is applicable to network transfers on systems such as personal computers connected to an ISP server or any remote computer. Also, the present invention is advantageous for smaller computing devices where memory and display resources are a premium such as  
20 embedded devices, personal digital assistants (PDA), a web phone, a smart wallet, a digital pen, a camera and the like.

25 While the invention has been described in terms of preferred embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the appended claims.

## CLAIMS

We Claim:

- 1     1.    A method of transferring data across a computer  
2     network, said computer network including a plurality  
3     of computers, a database stored on one of said  
4     plurality of computers, said method comprising the  
5     steps of:  
6         setting data transfer constraints;  
7         requesting transfer of data stored on a remote  
8     computer system;  
9         identifying at least one object included in  
10    said requested data as being associated with a  
11    generic object; and  
12         substituting the generic object for each of  
13    said at least one object responsive to said data  
14    transfer constraints.
- 1     2.    A method as in claim 1 wherein said stored data  
2     includes image and sound data.
- 1     3.    A method as in claim 2, wherein image data is  
2     requested by a user for display on a web browser,  
3     said generic object being substituted in a web  
4     browser image, said method further comprising:  
5         displaying said web browser image.
- 1     4.    A method as in claim 3, wherein the remote  
2     computer system identifies generic objects.
- 1     5.    A method as in claim 4, wherein while the web  
2     browser image is being displayed, the remote

3 computer system is transferring generic object codes  
4 associated with related images.

1 6. A method as in claim 5 wherein when related  
2 images are displayed, said generic objects  
3 associated with said transferred generic object  
4 codes are substituted in said displayed related  
5 images.

1 7. A method as in claim 6 wherein a requested  
2 object is transferred while a corresponding generic  
3 object is being displayed and further comprising:  
4 replacing and displaying each corresponding  
5 generic object with each said requested object when  
6 said requested object is received.

1 8. A method as in claim 7, wherein the data  
2 transfer constraints include a peak net traffic  
3 constraint, a client quick mode constraint, a server  
4 quick mode constraint and an importance level.

1 9. A method as in claim 8, wherein when said  
2 importance level is high, data is transferred from  
3 said database and the web browser image is displayed  
4 normally.

1 10. A method as in claim 8, wherein when peak net  
2 traffic is below said peak net traffic constraint,  
3 data is transferred from said database and the web  
4 browser image is displayed normally.

1 11. A method as in claim 8, wherein when said  
2 client quick mode constraint is not selected, data  
3 is transferred from said database and the web  
4 browser image is displayed normally.

1 12. A method as in claim 8, wherein when said  
2 server quick mode constraint is not selected, data  
3 is transferred from said database and the web  
4 browser image is displayed normally.

1 13. A method as in claim 5, wherein while the web  
2 browser image is being displayed, the remote  
3 computer system is further transferring additional  
4 generic objects associated with said related images.

1 14. An interface device for connecting to and  
2 retrieving data from a remote computer system, said  
3 interface device comprising:  
4 means for setting data transfer constraints;  
5 means for requesting data from a remote  
6 computer system;  
7 means for storing a plurality of generic  
8 objects, each stored generic object corresponding to  
9 an original object in data requested from said  
10 remote computer system;  
11 means for substituting each stored said generic  
12 objects for said corresponding object; and  
13 means for outputting said requested data, said  
14 output data selectively including said generic  
15 objects or corresponding original objects responsive  
16 to said data transfer constraints.

1 15. The interface device as in claim 14, wherein  
2 the outputting means is a video display.

1 16. The interface device as in claim 14, wherein  
2 the interface device is a speaker.

1 17. A method of compressing digital images,  
2 comprising the steps of:  
3 a) identifying objects in a digital image;  
4 b) identifying names of identified objects;  
5 c) identifying a position of identified  
6 objects;  
7 d) identifying a position relative to one of  
8 said identified objects in the digital image;  
9 e) identifying characteristics of the  
10 identified objects;  
11 f) replacing identified objects with generic  
12 objects, position data and characteristics; and,  
13 g) sending the modified digital image to a  
14 client system for display.

1 18. A method of restoring a compressed image  
2 comprising the steps of: a) identifying  
3 generic objects in received image data;  
4 b) identifying corresponding objects in  
5 subsequently received data;  
6 c) replacing said identified generic objects  
7 with said corresponding objects; and  
8 d) displaying said image.

1 19. A computer program product for transferring  
2 data across a computer network, said computer

3 network including a plurality of computers, a  
4 database stored on one of said plurality of  
5 computers, said computer readable program code  
6 comprising:

7 computer readable program code means for  
8 setting data transfer constraints;

9 computer readable program code means for  
10 requesting transfer of data stored on a remote  
11 computer system;

12 computer readable program code means for  
13 identifying at least one object included in said  
14 requested data as being associated with a generic  
15 object; and

16 computer readable program code means for  
17 substituting the generic object for each of said at  
18 least one object responsive to said data transfer  
19 constraints.

1 20. A computer program product as in claim 19,  
2 wherein image data is requested by a user for  
3 display on a web browser, said generic object being  
4 substituted in a web browser image, said computer  
5 program product further comprising:

6 computer readable program code including a  
7 database with a plurality of generic objects.

1 21. A computer program product as in claim 20,  
2 further comprising:

3 computer readable program code for transferring  
4 additional generic objects associated with related  
5 images while the web browser image is being  
6 displayed.



1        22.    A computer program product as in claim 21,  
2        further comprising:  
3                computer readable program code for substituting  
4        said additional objects for said related object when  
5        a related image is displayed.

1        23.    A computer program product as in claim 20,  
2        further comprising:  
3                computer readable program code for transferring  
4        requested object while a corresponding generic  
5        object is being displayed and when said requested  
6        object is received. replacing and displaying each  
7        corresponding generic object with each said  
8        requested object.

**SYSTEM AND METHOD FOR INFORMATION TRANSFER OVER A  
NETWORK  
ABSTRACT**

An interface device for connecting to and  
5 retrieving data from a remote computer system, and  
method of compressing, decompressing and  
transferring data therefor. A user may set transfer  
constraints on the interface device. The interface  
device may be a web browser. The user selecting a  
10 web site requests data, normally image data from a  
remote computer system. The interface device  
includes a cache memory where generic objects may be  
stored. Each generic object corresponds to an  
original object in the requested data. Depending on  
15 the data transfer constraints, instead of retrieving  
the entire image, e.g., web page image, unaltered  
from the host system, a compact generic image is  
retrieved, initially, wherein generic objects are  
substituted for each corresponding original object.  
20 A pseudo-image is displayed, with the generic  
objects substituted for corresponding original  
objects. Subsequently received original objects may  
be substituted for generic objects as each original  
object is received.

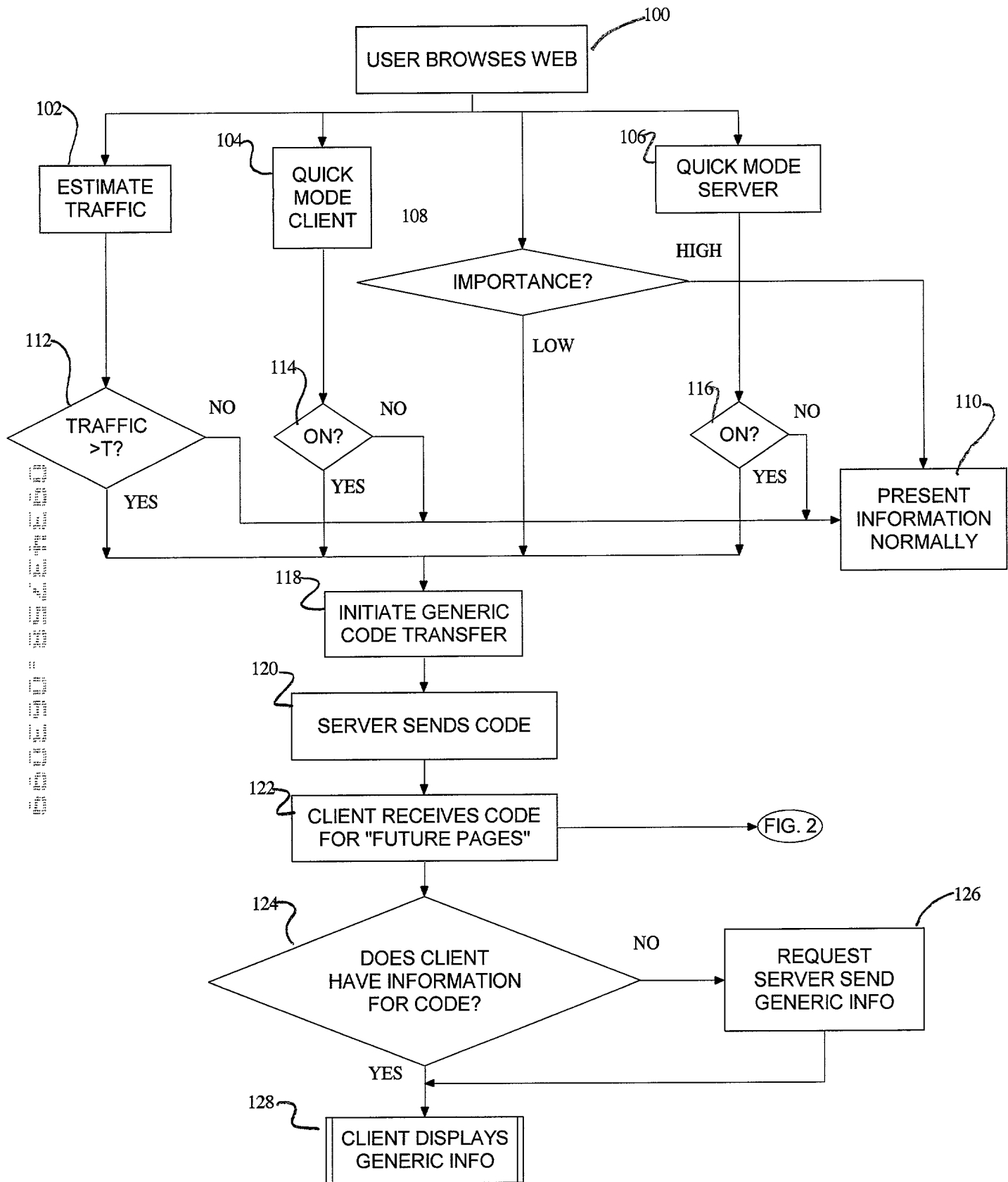


FIG. 1

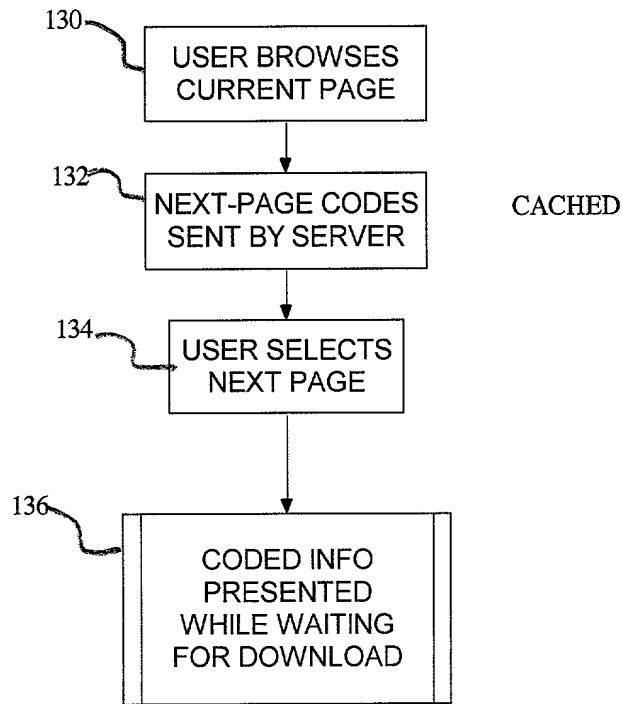


FIG. 2

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Group Art Unit: Unknown

Examiner: Unknown

In Re PATENT APPLICATION OF:

Applicant(s) : Dimitri KANEVSKY et al. )  
 )  
Appln. No. : TO BE ASSIGNED )  
 )  
For : SYSTEM AND METHOD FOR )  
INFORMATION TRANSFER OVER A )  
NETWORK )

**ASSOCIATE**  
**POWER OF**  
**ATTORNEY**

Attorney Ref.: YO9-99-183

**ATTENTION: BOX NON-FEE AMENDMENT**

Assistant Commissioner of Patents  
Washington, D.C. 20231

Sir:

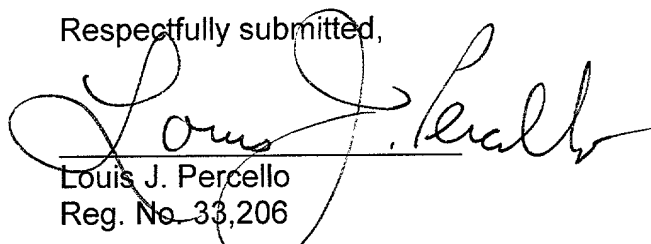
As attorney of record in the above referenced application, pursuant to 37 C.F.R. § 1.34(b), I hereby appoint the following registered practitioners to prosecute this application and to transact all business in the Patent and Trademark Office, connected therewith: Steven M. Rabin (Reg. No. 29,102), Thomas M. Champagne (Reg. No. 36,478), Robert H. Berdo, Jr. (Reg. No. 38,075), Charles W. Peterson (Reg. No. 34,406), 1725 K Street, N.W., Washington, D.C. 20006, Telephone: (202) 659-1915.

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Respectfully submitted,

Date: 6/7/99

  
Louis J. Percello  
Reg. No. 33,206

EXPRESS MAIL LABEL NO. EL295374479US  
DATE OF DEPOSIT: JUNE 30, 1999

**DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**SYSTEM AND METHOD FOR INFORMATION TRANSFER OVER A NETWORK**

The specification of which

  X   is attached hereto.

           was filed on                                  as United States Application Number or PCT International Application Number                                  and was amended on                                  (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, '119 (a) - (d) or '365 (b) of any foreign application (s) for patent or inventor's certificate, or '365 (a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application, having a filing date before that of the application on which priority is claimed:

Prior Foreign Application (s)			Priority Claimed
<u>                    </u>	<u>                    </u>	<u>                    </u>	Yes <u>    </u> No <u>    </u>
(Number)	(Country)	(Day/Month/Year Filed)	
<u>                    </u>	<u>                    </u>	<u>                    </u>	Yes <u>    </u> No <u>    </u>
(Number)	(Country)	(Day/Month/Year Filed)	
<u>                    </u>	<u>                    </u>	<u>                    </u>	Yes <u>    </u> No <u>    </u>
(Number)	(Country)	(Day/Month/Year Filed)	

I hereby claim the benefit under 35 U.S.C. '119(e) of any United States provisional application(s) listed below.

<u>                                </u>	<u>                                </u>
(Application Number)	(Filing Date)
<u>                                </u>	<u>                                </u>
(Application Number)	(Filing Date)

EXPRESS MAIL LABEL NO. EL295374479US  
DATE OF DEPOSIT: JUNE 30, 1999

I hereby claim the benefit under 35 U.S.C. '120 of any United States Application (s), or '365 (c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States, or PCT International application in the manner provided by the first paragraph of 35 U.S.C. '112, I acknowledge the duty to disclose information material to the patentability of this application as defined in 37 CFR '1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor I hereby appoint the following attorney (s) and/or agent (s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (list name and registration number).

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